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Oregon Agricultural College

Experiment Station

Insect Pests and Diseases of Currants and Gooseberries

By
A. L. LOVETT and H. P. BARSS

Gooseberry mildew readily controlled. On left, branch from unsprayed bush showing berries ruined by mildew. On right, branch from a bush of the same variety sprayed with lime-sulfur showing complete control

CORVALLIS, OREGON

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Insect Pests and Diseases of Currants and Gooseberries

CURRANT AND GOOSEBERRY INSECTS

By
A. L. LOVETT

Currants and gooseberries, while not subject to attack by as many different kinds of insects as are some of our other small fruits, have a few pests that may cause serious injury. These include fruit worms, foliage pests, bud destroyers, and at least three species of borers which tunnel the canes, crown, and root.

THE CURRANT AND GOOSEBERRY MAGGOT OR YELLOW FRUIT FLY[1]

Description. Small, white, cylindrical maggots, blunt behind and tapering to a point at the head end, found inside the fruit of the currant and gooseberry.

Fig. 1. Adult yellow fruit-fly or currant and gooseberry maggot. Showing characteristic appearance and banded wings. *Enlarged.*

The adult is a rather small, attractive, lemon-yellow fly, the wings crossed by smoky bands.

Life-history and Habits. Winter is passed in the soil, under and immediately adjacent to the bushes, at a depth of from one-half to three inches below the surface. They occur at this time as small, brownish capsule-like cases, not unlike grains of wheat.

The flies come out during May, usually from May 15 to 25. They sport about on the foliage for a few days, lapping up moisture and bits of honey dew from the surface of the leaves.

After a short time they commence stinging the berries, which are by this time of a fair size, laying their eggs under the skin of the fruit. The young maggots hatch in three to eight days and work their way through the flesh to the seeds. They feed on the seeds, later webbing several of them together and eating out the interior. The mass of webbed-up seeds and excrement can be seen from the outside, through the semi-transparent skin and pulp, appearing as a distinct darkened area within.

The maggots are full grown in mid-June, crawl out of the fruit, drop to the ground and enter the soil. Their tendency is to move about very little after dropping, hence by far the majority of them enter the ground under or immediately adjacent to the bushes. Here they change over into the little brown case and so remain until the following spring.

The Injury. Wormy berries are unfit for food. Often as high as 30 to 50 percent of the berries are infested, and a total loss of the crop is not uncommon. Infested berries tend to ripen prematurely and, with some varieties, will usually drop from the bushes.

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[1] *Epochra canadensis* Loew.

Control

Standard sprays are ineffective. A sweetened poison spray consisting of lead arsenate (2 ounces), sirup (1 quart), and water (3 gallons) is attractive to the flies and will kill them where sprayed lightly on the foliage during May while the flies are out. Due, however, to the frequent showers at that season of the year washing off the spray and the consequent necessity of frequent repetition of the application, this treatment has not proved commercially successful in tests made by the Experiment Station.

Taking into account the fact that for nearly eleven months of the year the insect occurs in a helpless state in the first few inches of surface soil beneath the plants; any practice that will disturb or destroy these resting forms is of value in control. Frequent stirring of the surface soil under and immediately adjacent to the bushes during late summer, fall, and early spring will expose many of these pupae to adverse weather conditions, to attacks by birds, etc. In tests at the Experiment Station better cultural practices alone—i. e., closer and more frequent cultivation—have reduced the infestation to a negligible factor.

Poultry allowed to run in the yards just after harvest will destroy many of the pupae. Their interest should be aroused by raking the surface trash and debris from under the bushes to the center of the row. After they once discover the dainty titbits they will search out a goodly share for themselves.

Early maturing varieties are less heavily infested than are the later berries. Commercial fruit should be picked just as soon as ripe. Often the worms are so small as to escape detection and have no apparent deleterious effect on the fruit.

DEFOLIATING CURRANT AND GOOSEBERRY WORMS

Two kinds of worms attack the foliage of currants and gooseberries. Usually defoliation becomes serious just about the time the fruit is maturing.

Description. The native currant worm is the commoner defoliating worm in Oregon. This is a velvety green, caterpillar-like worm found feeding on the foliage of both currant and gooseberry. The other worm is of a general greenish color with small black spots over the body giving a dappled or mottled effect.

The adult, in both cases, is a small, black, robust, wasp-like insect, usually occurring in numbers about the foliage at blossoming time.

Life-history and Habits. The life-history will vary somewhat for the two species, but in general winter is passed in or on the surface soil in parchment-like cocoons; adults plentiful in the field during blossoming; eggs deposited within the tissue of or along the main veins of the leaves.

Eggs hatch in about ten days, and young worms attack the foliage. They feed sparingly at first, but as they increase in size they eat voraciously and where numerous can strip a plant of foliage in a few days. The worms become full grown in two to three weeks. They drop to the ground and spin their cocoons, within which they slowly change to the adult sawfly stage. There is another brood of adults and worms soon

after the first brood of worms ceases feeding. In extreme cases we have records of two successive defoliations of the bushes in a season.

The Injury. As indicated, the injury is due to the feeding of these worms on the foliage. They work rapidly and not infrequently the grower's first intimation of their presence is the stark, defoliated bushes with their shriveling crop of nearly mature berries.

Control

Lead arsenate, 1 lb. to 50 gals. water, will control these worms. The ideal time to spray is about two to three weeks after blossoming. Direct the solution as an under spray, coating the under surface of the leaves with poison. An angle nozzle attachment will assist materially in this. Lead arsenate dusts, carefully applied, are equally effective and could be applied to the nearly mature fruit without unduly splotching it up.

Where sprays are applied late, so that the fruit might be rejected because of the spray blotches, or the possible danger of poisoning causes the grower to hesitate to spray with lead arsenate, substitute white hellebore powder (obtainable from your druggist), using it at the rate of one ounce to three gallons of water. This is a practically colorless powder, practically non-poisonous to human beings. It kills the worms both by contact and as a poison. Apply as directed above for lead arsenate.

THE CURRANT APHIS[2]

Description. The foliage of red currants distorted and highly colored. Small yellowish, soft-bodied aphids or plant lice clustered in the "galled pockets" on under surface of leaves.

Life-history. Winter is passed as small, cucumber-shaped black eggs on the bark of the new canes. Aphids hatch in the spring as the leaf buds open. The young aphids crawl to the unfolding leaves and begin to feed. These aphids are full grown in about twelve days and begin giving birth to living young. All the aphids occurring during the spring and summer are these "stem mothers" capable of giving birth to living young. There are no males until autumn. All summer long they multiply rapidly in this unusual, but very efficient manner. During the spring nearly all the aphids are without wings, but as the season advances winged forms appear and fly to other bushes. In the fall the true sexed aphids appear. Eggs are laid on the bark, and as eggs the winter is passed.

The Injury. Common on red currant. May occur on black currant and gooseberry. The foliage is cupped, galled, distorted, and discolored, the upper surfaces of the leaves usually becoming highly colored and malformed. The aphids excrete honey dew in abundance and this sticky substance covers foliage and fruit with a smeary coating.

Control

Lime-sulfur, 1 to 20 plus nicotine sulfate 40 percent , 1 to 800 is the standard currant aphis spray. (This equals: Lime sulfur concentrate, 2 quarts; Black leaf 40, 3 tablespoonfuls to 10 gallons of water.) Apply

[2] *Myzus ribis* Linn.

in late March as the leaf buds are opening. An aphis spray is seldom required on gooseberry. For later summer sprays substitute one-half pound of soap dissolved in hot water for the lime-sulfur in the 10 gallons of spray.

Commercial nicotine dusts for summer infestations were more satisfactory than the liquid sprays in tests at the Experiment Station. Dusts must be applied during a warm, still period. Apply lightly through a cheese-cloth bag, or for commercial plantings use a knapsack duster.

ROOT AND CANE BORERS

There are three borers found working on the canes, crowns, and roots of currants and gooseberries. Not a great deal is known about the habits of these insects and no control measures are known aside from a few precautionary measures and the cutting out of infested parts.

THE CURRANT CANE-BORER[3]

Description. Canes discovered in early summer or autumn with the foliage wilting. Interior of cane with tunnels and medium-sized white borer, the body pinched in or constricted beneath, the head brown. Adults are showy, clear-winged, blue-black moths with yellow markings.

Life-history and Habits. Winter is passed as full-grown borers in the canes. The moths emerge in June and fly from plant to plant. The eggs are deposited singly on the bark of the canes. The young borers, upon hatching, burrow within the canes and proceed to tunnel up and down. Full grown by fall, they hibernate over winter as grubs in the canes.

The Injury. Infested canes appear devitalized in the late summer and fall, but usually have sufficient vitality to put out sickly foliage in the spring. The infested canes are sickly and weak.

Control

No sprays effective. Cut out infested canes as soon as discovered and destroy.

FLAT-HEADED BORERS[4]

Description. Occasionally the borer found working in the canes, crown, and root is distinctly different in appearance from the regular currant cane-borer. The borer worms are elongate and slender except at the head end, where they are broad and flattened.

The adult of this borer is a small grey, flattened, rather boat-shaped beetle.

Life-history and Habits. Not at all well known. The beetles are in the field during the summer months laying eggs. The borers hatch and tunnel more or less in the fall, pass the winter in the plant, and probably require most of the following summer to grow to maturity.

The Injury is more general in character, all parts of the plant being attacked. In respect to distribution and prevalence of injury, this borer is only occasionally serious. Both currants and gooseberries are attacked.

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[3]*Sesia tipuliformis*, Clerck.

[4]*Chrysobothris mali* Horn. *Dicerca pecterosa* Lec.

Control

Same as above: Cut out and destroy infested canes or plants.

THE BLACK GOOSEBERRY BORER[5]

Description. Borer worm is similar in appearance to the currant cane-borer. It is whiter in color, cylindrical, without constricted effect and works in the root and crown and at the base of the canes, rather than entirely in the canes. Probably does not attack currant.

Life-history and Habits. Not well known. The adult is a black beetle instead of a moth.

The Injury. The entire plant is often killed in the older fields. There are often many borers in a single plant, their burrows so numerous as to give more or less of a honeycomb effect to the interior of the crown.

Control

This borer is a comparatively new pest of gooseberry. Apparently it is a native of the Northwest and has become serious on cultivated gooseberries since their introduction to Oregon.

The pest is assuming serious proportions in some of our commercial gooseberry sections. In considering new plantings, examine the cuttings carefully for evidence of the borer and either discard infested plants or carefully remove borers. Insist, if possible, on cuttings from borer-free plantings.

Older fields, where heavily infested, should be destroyed. In younger plantings, dig and burn the occasional infested plant. If doubtful as to the identity of the pest, submit specimens to the Oregon Experiment Station for determination.

MINOR INSECT PESTS

Red Spider-mites may occasionally, particularly in dry seasons, become injuriously abundant on currant and gooseberry.

They manifest themselves as minute spider-like creatures, yellowish in color, hurrying about over gauze-like webs on the under surface of the leaves. The infested foliage appears devitalized, yellow in color, and with a general lack of thrift.

Control by dusting or spraying with superfine dusting sulfur.

The Cottony Scale. The canes are sometimes infested with large, soft, brown scales. The side of the scale is often raised, and masses of cottony, waxy threads are protruded.

Oil sprays during the dormant season will control. Lime-sulfur is not equally effective. Oil sprays may be used during the growing season to check the scale, if serious. Dilute a light miscible oil 3 to 100 for summer use.

Big Bud. Rarely in Oregon we find cases where the buds of currant are galled and enlarged to an abnormal degree. This is the work of a microscopic mite. Very little is known of the insect. Dormant lime-sulfur spray, very thoroughly applied, should control.

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[5] *Xylocrius cribratus* Lax.

The Bud Midge. Just recently, an apparently new pest of gooseberries has been found attacking the dormant buds. This insect belongs to a group known as the gall midges. The larvae apparently work on the interior of the dormant buds causing them to blight and scale off the bushes.

Nothing is known of the insect; from the evidence at hand it appears as a pest of possible importance. Look over the buds carefully in early March; where abnormal or shedding badly, examine the interior of the bud for an orange-colored or brownish object. Send samples to Oregon Experiment Station.

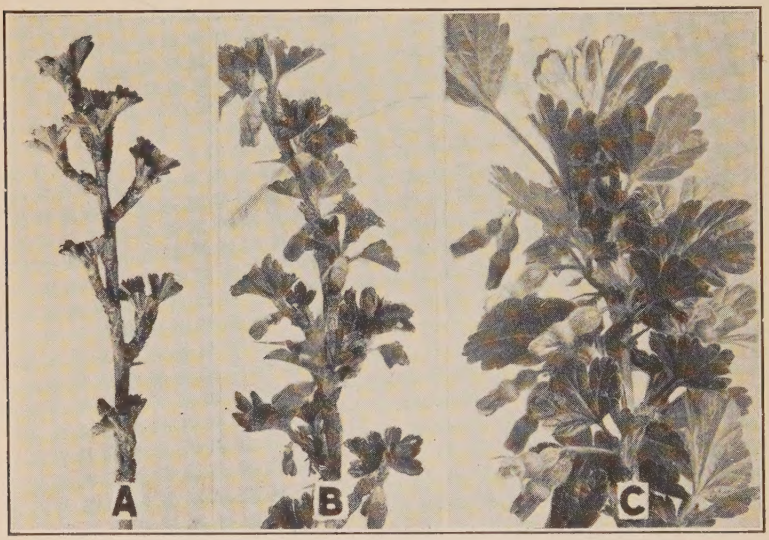

Fig. 2. Spraying stages for control of gooseberry mildew by use of lime-sulfur. When disease is severe all three sprays may be required. When under good control the last can often be safely omitted.

DISEASES OF CURRANT AND GOOSEBERRY

By

H. P. BARSS

Although some of the diseases commonly affecting these plants remain to be investigated as to cause and control, successful preventive measures have been worked out for the two most prevalent and troublesome fungous diseases to which they are subject.

POWDERY MILDEW

Symptoms. This disease is the common cause of serious crop losses in the case of gooseberries. It also occurs occasionally on currants but ordinarily causes little damage to these fruits, the attack being for the most part confined to the leaves.

On the gooseberry the fungus grows as a white, powdery surface mold attacking leaves and green shoots and particularly the fruit. The fruit is conspicuously stunted and the white covering changes before the fruit is mature to a brown coating which renders the berries unmarketable.

In severe attacks the vitality of the bushes is reduced and unproductiveness follows.

Cause. The cause is a fungus, *Sphaerotheca mors-uvae*, growing externally but feeding on the skin cells of the green parts. It is carried through the winter on the old leaves and twigs and in the buds. It starts growth as soon as the buds push out in the spring and continues through the season.

European varieties are very much more susceptible than the American types. The Oregon Champion is less susceptible than the common European types but is often seriously affected.

Control

The Oregon Experiment Station has found that the disease can readily be controlled by lime-sulfur sprays. Specially prepared dusting sulfur applied with a blower has also given good results, but more frequent applications appear necessary than with the liquid sprays. While certain other materials are reported as giving good results, the success obtained with ordinary lime-sulfur warrants the recommendation of its use until something superior is worked out. Bordeaux mixture is not of satisfactory effectiveness against the mildew.

The exact spray program for the individual grower will depend upon the severity of attack, but the tests of the Station indicate that the early applications are the most effective, apparently because they check the mildew before it succeeds in getting a good start in the spring. In the most severe attacks, however, three sprays were found to result in almost perfect control the first year. After the disease is once conquered, the last spray or perhaps the last two may be omitted provided the first is thoroughly applied. The grower should, however, watch for signs of developing mildew throughout the season and apply a spray if the disease reappears. The program recommended is as follows:

1. Lime-sulfur (liquid, 32° Baume' test) one part to 30 parts of water. Apply just as the leaf clusters first begin to open out. (If dry lime-sulfur is used, employ at the rate of 4 lbs. to 30 gallons of water.)

2. Lime-sulfur 1 to 40 (Dry 4 lbs. to 40 gals.). Apply just before blooming.

3. Repeat if necessary, using about the same strength, after the fruit is set.

Note: The spray will sometimes cause burning of the leaf edges. The burning is rapidly outgrown, however, and should cause little concern. It is best applied in bright and dry but not hot weather. Varieties that prove very sensitive to lime-sulfur may be sprayed with Atomic Sulfur (12 lbs. to 100 gals.) or other non-caustic sulfur spray, or may be dusted with special dusting sulfur.

CURRANT AND GOOSEBERRY ANTHRACNOSE OR LEAF SPOT

Symptoms. This disease causes very small leaf spots which when abundant may result in yellowing and dropping of the foliage in mid-season. This greatly reduces the vitality, growth and productiveness of the plants. Currant fruits may also be attacked by the spots.

Cause. The cause of the disease is a parasitic fungus known as *Pseudopeziza ribis*. It is spread by means of minute spores during moist weather. These spores are produced abundantly in the spots on the leaves or fruit and readily cause new infections which in turn produce a fresh crop of spores. The disease is carried over the winter on the old fallen leaves, which discharge spores during the early part of the growing season, thus bringing about the primary infections on the newly developed foliage.

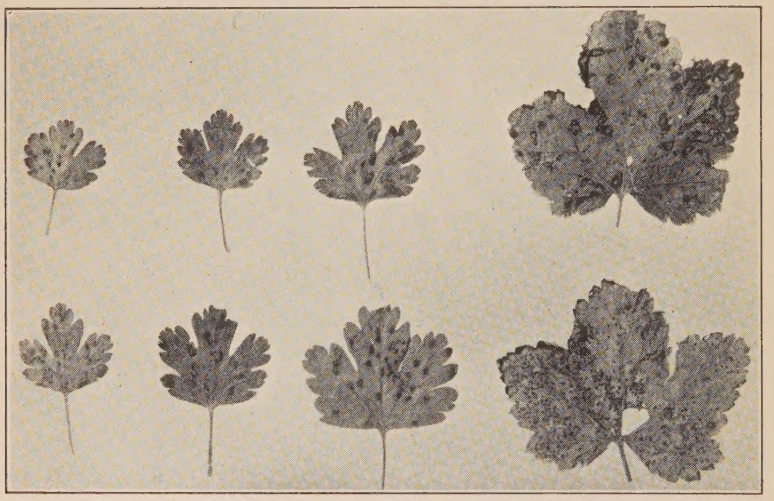

Fig. 3. Gooseberry and currant leaves showing leaf spots due to the anthracnose disease. Bordeaux spray is the best preventive.

Control

If every particle of the old infected leaves could be destroyed before the buds start in the spring, the disease would probably be checked completely. To rely on such a method of control is, however, manifestly impracticable, and the grower has to depend upon spraying, although turning under or raking and burning the old leaves as far as possible should be of some value.

If anthracnose were the only disease to be dealt with, as may frequently be the case with currants, the Experiment Station would recommend bordeaux mixture (4-4-50) for all applications. But mildew is so common, particularly with gooseberries, that the best plan is to spray with lime-sulfur as recommended for mildew control until after the berries are harvested, at which time a thorough spraying with bordeaux

mixture 4-4-50 will give practically complete foliage protection for the rest of the growing season. The usual spray program will be as follows:

1. When the first leaves approach full size use lime-sulfur. (Liquid, 1 gal. to 40 gal. water; or dry, 4 lbs. to 40 gal. of water.) This will come in as one of the mildew sprays for gooseberries. If mildew is not prevalent use bordeaux 4-4-50 instead.

2. Just after the fruit is picked spray thoroughly with bordeaux 4-4-50. Lime-sulfur may be used but is not considered quite as effective and is more liable to cause spray injury during hot weather.

Fig. 4. Wilt of new shoot of gooseberry due to attack of *Botrytis*.

DIE-BACK OF CURRANT AND GOOSEBERRY

Symptoms. In this type of trouble individual new shoots may wilt down and die during the growing season or the branches may be found dead in the spring. Old and devitalized bushes appear to be particularly subject to this condition.

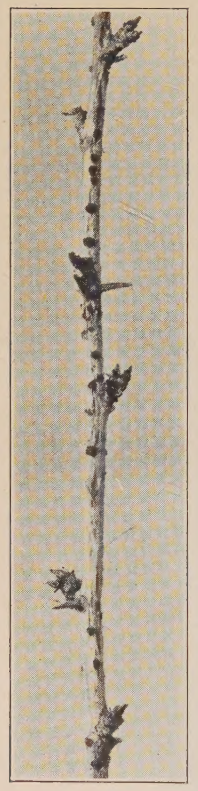

Fig. 5. Dieback of gooseberry. Dead twig showing little black stromata of *Plowrightia ribesia*.

Causes. Two different kinds of fungi may attack gooseberry or currant plants in this manner. One belongs to the genus *Botrytis* while the other is known as *Plowrightia ribesia*. They are disseminated by means of spores like all fungi. It is entirely possible that some dying back may be caused by lack of cultivation, drouth, or poor soil conditions alone, or that lack of vitality renders the bushes subject to attack.

Control

The Experiment Station has not as yet been able to investigate control methods under Oregon conditions, but it is quite probable that keeping the leaves and branches covered with bordeaux mixture as advised for anthracnose control will prevent much of the damage. At all events good culture and renewal of soil fertility regularly are always desirable for the maintenance of profitable productiveness.

WHITE PINE BLISTER RUST

The cultivated English or European black currant is exceedingly susceptible to attacks by the fungus causing the destructive white pine blister rust whose presence is threatening the existing forests of western white pine and sugar pine on the Pacific Coast. The cultivated gooseberry and ordinary cultivated red and white currants are rather resistant to the disease.

The cultivated black currants receive infection from diseased white pines by spores which are able to drift through the air for many miles. They may also be infected by spores from other plants of the same family and kind. Spores from rusted black currants are able to pass to susceptible pine trees and cause infections on them. In other words, the black currant is the most dangerous stepping stone for the spread of the disease.

As a safety measure the Oregon legislature in 1923 passed a law declaring the cultivated black currant a public nuisance and forbidding the growing or planting of it in the state. Good citizens are cooperating in this means of safeguarding our pines. Since red and white currants and gooseberries are of little consequence in the early spread of the disease, it is not required that they be eradicated.

Note: Directions for the preparation of any of the spray materials mentioned here may be obtained on request from the Experiment Station.